in size; 2. Variation caused by exercise, training, and education; 3. Variations due to disease; 4. Characters assumed as the result of accident or mutilation. It is well settled that abundance of food affects the development and size of the individual and of the offspring. All cattle-breeding proceeds on this postulate. A good example of the second class of variations is afforded by the evolution of the trotting horse, which began during the present century, and has proceeded so far as to produce a breed of horses which have actually lost the instinct to run, and trot even while they are young. Variations due to disease are equally powerful, but less susceptible of demonstration. An example is ringbone in horses, caused by accident to the individual, but transmitted to offspring. As regards heredity of mutilations, numerous instances are cited, among which were enumerated several cases of malformed fingers in offspring of parents whose fingers had been injured by accident. Conspicuous instances of sports developing into varieties are certain forms of merino-sheep, and sequoia-trees of a certain type of foliage. Professor Brooks, in discussing the paper, according to the abstract in *The Medical Record*, opposed Brewer's view, and said that adaptations of nature have been evolved for the good of the species, not for that of the individual: hence they are not ordinarily transmitted, and the inherited effect of the influence of environment bears no appreciable effect on the evolution of species. Thus the larva of worker and drone bees is protected by an envelope of silk all around, while that of the queen bee leaves the abdomen unprotected, for the obvious purpose of enabling the mature queen to sting her larval rival when the swarming season is over, thus sacrificing the individual for the good of the community. The generation of polymorphic hydroids is an instance where the functions of generation are not exercised by the working members of the group, so that instincts acquired by experience are not transmitted. The bodies of all animals are similar polymorphic aggregations of cells. The cells of the body which are exposed to external influences and vicissitudes are outside the line of succession in generation. Dr. H. C. Wood of Philadelphia also opposed Brewer's conclusions. He doubts whether there is such a thing as hereditary disease. It is not the disease, but the liability to disease, that is inherited; in other words, the lack of power of resistance to external irritation. Consumption, for instance, is caused by the presence of an organism, the bacillus. This bacillus is certainly not inherited. We all breathe it, but not all become consumptive. Persons who have not sufficient power of resistance are affected by disease. These persons have inherited a weak constitution, or their powers of resistance have been weakened. This is all the heredity there is about it.

NOTES AND NEWS.

THE recent great reduction in the price of aluminum, made possible by improved methods of production, will doubtless lead to its adoption, to the exclusion of other metals, in the manufacture of transits, compasses, field and opera glasses, hand-levels, etc. The fact that it takes a beautiful finish, has a low specific gravity, is easily worked, and is practically non-corrosive, makes it the ideal metal for such purposes.

— The properties of quicksand are thus described in the *Mechanical News*: "The difference between building-sand and true quicksand is most easily explained by comparing building-sand to road-metal, while the quicksand must be represented by fragments no larger than large buckshot, but shaped like very smooth potatoes. In a word, the quicksand is small and thoroughly water-worn, so that every fragment has been deprived of all its angles and fairly well polished. Its particles are very small as compared with those of the building-sand. The smaller the size and the more complete the rounding, the more nearly will the sand approach a liquid condition when it is moistened. The first glance at a fairly mounted sample of quicksand under a microscope is sufficient to show that the quickness of the sand is amply accounted for by the innumerable friction-wheels which the particles themselves furnish. Sharp or building sand, on the other hand, will show few round corners, many angles, corners, and a general condition like that of broken stone. Sea-sand is often unfit for building, even though perfectly deprived of its salt, the reason being that the particles have been worn and polished till they have no more binding-power than so many cobblestones. It is well to remember that quicksand when dry, if very fine, shows the same properties as a liquid. In holding up the centres of large bridges, it is sometimes put into cylinders with a plunger on top of it. It will, when thus confined, hold up the load like a column of water. When it is desired to strike the centres, a plug is drawn out of the side of the cylinders, and the sand flows out like so much water. The advantage, of course, is that the sand does not need a packed piston, and does not leak out, though the work be prolonged for years. Quicksand, when dry and confined, forms an admirable foundation, and when wet can be loaded over its whole surface, and give a good support if side openings can be avoided.

— According to the Paris correspondent of London *Industries*, the Maussier process of manufacturing aluminum is coming to the front, for it is announced that one of the largest engineering firms has undertaken to work it on an extensive scale. The process, he continues, comprises three distinct periods and kinds of operations, — the desilification, the reduction, and the liquation. The desilification is effected by means of fluorine or fluoride of calcium at a high temperature in the presence of carbon. Lime, or the carbonates of potassium or sodium, may be added to facilitate the decomposition of the silicate. The reduction or expulsion of the oxygen is obtained by means of iron and manganese raised to incandescence in the presence of carbon. The liquation, the object of which is to separate the aluminum from the iron and the manganese, is effected by dropping the molten mass into carbon ingot moulds. These moulds are made of wood-charcoal. The aluminum so obtained is nearly pure.

— To add to the many obligations under which he has laid Cambridge University, Professor Sidgwick has offered to give £1,500 towards the completion of the new buildings urgently required for physiology, on condition that the work is undertaken forthwith. The Financial Board has accordingly recommended a scheme by which this can be effected. *Nature* adds, "The alliance between mental science and physiology which this gift represents is a bright feature of Cambridge studies at present."

— A novel and interesting application of science to art may now be seen at the Arts Exhibition, London, where Mrs. Watts Hughes shows specimens of what she calls "voice figures." As described in *Nature*, these are practically Chladni's figures produced in a viscid medium. Semi-fluid paste is spread on an elastic membrane stretched over the mouth of a receiver. A single note "steadily and accurately sung" into the receiver throws the paste into waves and curves. The patterns formed are either photographed immediately after production, or are transferred as water-color impressions while the membrane is still vibrating. Fanciful names, e.g., "wave," "line," "flower," "tree," "fern," are given to these. The effect, especially in transparencies, is very beautiful. Some of the forms would repay the study of physicists as well as of artists. The most interesting are perhaps the "daisy forms," in which we are told that "the number of petals increases as the pitch of the note which produces them rises." The apparatus employed is not exhibited, and the descriptive label is not very clear, but we understand that Mrs. Hughes would be most pleased to explain the matter to any one scientifically intererested in it. Her address is 19 Barnsbury Park, N.

— The recently established Geological Survey of Arkansas, of which Dr. John C. Branner is director, has taken up its work with remarkable vigor and success. The first volume, containing the administrative report for 1888 and a report on the geology of western central Arkansas, was rapidly followed by the second, on the neozoic geology of south-western Arkansas, the body of which is the result of the joint work of the United States Geological Survey and of the Geological Survey of Arkansas. By this co-operation Professor Robert T. Hill was able to extend his studies on mesozoic geology over Arkansas, and the volume is chiefly taken up by his report. The third volume is a preliminary report upon a portion of the coal-regions of Arkansas, which will be followed by a fuller report later on, as topographical as well as geological work is still being carried on.

— The medals of the Royal Society have this year been awarded as follows: the Copley medal to the Rev. Dr. Salmon, F.R.S., for his various papers on subjects of pure mathematics, and for the valuable mathematical treatises of which he is the author; a royal medal to Dr. W. H. Gaskell, F.R.S., for his researches in cardiac physiology, and his important discoveries in the anatomy and physiology of the sympathetic nervous system; a royal medal to Professor Thorpe, F.F.S., for his researches on fluorine compounds, and his determination of the atomic weights of titanium and gold; and the Davy medal to Dr. W. H. Perkin, F.R.S., for his researches on magnetic rotation in relation to chemical constitution.

— The rapid decrease in the number of kangaroos is beginning to attract the attention of scientific societies in Australia. From the collective reports of the various stock-inspectors it was estimated that in 1887 there were 1,881,510 kangaroos. In 1888 the number fell to 1,170,380, a decrease of 711,130. The chief obstacle to the adoption of measures for the effectual protection of the kangaroo, says *Nature*, is his vigorous appetite. One full-grown kangaroo eats as much grass as six sheep; and graziers, who as a class are not, it is to be feared, readily accessible to the influence of sentiment, find that the food eaten by this interesting animal might be more profitably utilized otherwise. In a communication on the subject, lately submitted to the Linnean Society of New South Wales, Mr. Trebeck suggested that the National Park might be used for the preservation not only of kangaroos, but of very many members of the Australian fauna and flora.

— The following, from a circular in regard to a one-thousand-dollar prize manual, may interest some of our readers: "The American Secular Union, a voluntary association having for its object the complete separation of Church and State in practice as well as in profession, and in no way committed to any system of religious belief or disbelief, acting herein by its president, Richard B. Westbrook, A.M., LL.D., as its special trustee and attorney-in-fact, hereby offers a premium of one thousand dollars lawful money of the United States for the best essay, treatise, or manual adapted to aid and assist teachers in our free public schools and in the Girard College for orphans, and other public and charitable institutions professing to be unsectarian, to thoroughly instruct children and youth in the purest principles of morality without inculcating religious doctrines; thus recognizing the legal right under our Federal Constitution of all our citizens, Jews and Gentiles, Catholics and Protestants, Liberals and Agnostics, and all other classes, whether believers or disbelievers, to have their children instructed in all the branches of a common secular education in our State schools, without having their tender minds biased for or against any sect or party whatever. It is desired that the manual for which this premium is offered shall not be a reading-book for schools, nor a mere code of morals, much less a system of ethical philosophy, but rather a concise yet comprehensive and suggestive exhibit, with familiar and practical illustrations of those universal foundation principles and axiomatic truths which underlie all sound morality and rightfulness, thus developing and educating that inherent moral sense which is more or less common to all rational human beings. In short, to show how to teach children the natural and essential difference between right and wrong, and the reasons therefor, without reference to sacerdotal creeds and sectarian dogmas, is the chief object to be kept in mind in writing for this premium; as it is the unquestionable right of every tax-payer and citizen of this free Republic to have their children educated in our common schools without having their minds prejudiced on those disputed subjects which may safely be intrusted to the family, the churches, and the Sunday-schools, where they properly belong. While each writer will be expected to confine himself or herself to the main object of this offer, the widest practical freedom in the form and range of treatment will be allowed, but all prejudice and partisanship regarding current controversies should be scrupulously avoided. The manual should not contain less than 60,000 words, nor more than 100,000, though these limits will not be insisted upon in a work of special merit. The papers should all be submitted by April 1, 1890, though more time will be granted if necessary; but the committee will be ready to receive manuscripts by the first day of January, 1890. Each manuscript should be in typewriting, or at least should be very legibly written, to insure a careful reading, and should have a special mark or designation, and the name and post-office address of the author should be sent at the same time in a sealed envelope—not to be opened until after the award is made—bearing the same mark, and both addressed to R. B. Westbrook, No. 1707 Oxford Street, Philadelphia, Penn., post or express prepaid. Unaccepted manuscripts will be returned to the writers at their own expense, and the accepted manuscript shall become the exclusive property of the Union, to be held in trust by the trustee herein named; and the premium of one thousand dollars will be promptly paid, without discount, when the copyright is thus secured. The money is now on deposit, in trust, with the Guarantee Trust and Safe Deposit Company in Philadelphia, for the object contemplated. A representative and impartial committee shall in due time be carefully selected by the subscribers to this fund or a majority of them, to act as judges of the manuscripts submitted, and to award the prize. The trustee herein named shall be a member and the chairman of said committee, whether he continues in the presidency of the American Secular Union or not. Writers of all nations are invited to join in the friendly contest, and the award will be made without regard to nationality or sex."

— The National Educational Association and Council of Education have decided to hold their next annual conventions at St. Paul, Minn., July 4 to 11, 1890. Hon. James H. Canfield of Lawrence, Kan., is president of the association. It is expected that there will be twenty thousand teachers present from all points of the Union. The Western railroads have already agreed to give half rates, plus two dollars membership fee, to all persons who attend; and Eastern and Southern roads will make low rates, which will be announced at an early date. St. Paul has organized a local executive committee, and the most complete arrangements are being made to give the teachers a welcome to the North-west, and to make the meeting a great success. There will be ample hotel accommodation at reasonable rates. Local excursions are being planned to all important points of interest in the North-west and on the Pacific coast, which will furnish teachers with the finest summer holiday trips that they ever enjoyed. The official "Bulletin," containing programmes, rates, and full particulars, to be issued in March, will be sent free by addressing S. Sherin, secretary local executive committee, St. Paul, Minn.

— A remarkably interesting paper on the last living aboriginal of Tasmania was read by Mr. James Barnard at the meeting of the Tasmanian Royal Society about two months ago. It has hitherto been generally believed that the aboriginal Tasmanians are extinct. Mr. Barnard, however, as we learn from *Nature*, contends that there is still one survivor, — Fanny Cochrane Smith of Port Cygnet, the mother of six sons and five daughters, all of whom are living. She is now about fifty-five years of age. Fanny's claims to the honor of being a pure representative of the ancient race have been disputed, but Mr. Barnard makes out a good case in her favor. He himself remembers her as she was forty years ago, when there were still about thirty or forty natives at Oyster Cave; "and certainly at that time," he says, "I never heard a doubt expressed of her not being a true aboriginal."

— No question in the range of agricultural subjects discussed is awakening more interest among New York's 350,000 farmers than the subject of cattle-foods and their economical use in feeding rations for the production of milk, and its products butter and cheese. This being true, it is believed that the information derived from scientific investigation, along with the practical experience of New York cattle-feeders, will be welcomed by dairymen as one advance step towards successful dairying. New York State has one and a half million milch cows, probably producing, on an average, less than three thousand pounds of milk per year; and the average annual butter product per cow for the State is undoubtedly less than one hundred and thirty pounds. This should not be, when there are whole herds averaging three hundred and some four hundred pounds of butter per year for each cow. Animals producing these by no means phenomenal yields are not confined to any particular breed, and are often grades of our so-called native

or no-breed animals. Proper selection, systematic breeding, and judicious feeding have produced these profitable animals and herds. What has been accomplished by the few should be striven for by the many, and feed must be a prime factor in developing the ideal dairy animal or herd. Careful breeding and selection must hold the most prominent place; but breeding and selection, unless accompanied by good care and judicious feeding, will ultimately result in failure. In the October bulletin of the New York Agricultural Experiment Station, of which Peter Collier is director, are brought together tables, with proper explanations, showing the composition of cattle-foods, the digestibility of such foods, the amount digested from various foods in general use, and finally several feeding-rations are given, together with those rations fed by a few of the farmers in different parts of the State.

— According to the *Novoe Vremya*, the carrier-pigeon has been turned to a curious use in Russia. It is to convey negatives of photographs taken in a balloon. The first experiment was made from the cupola of the Cathedral of Isaac, and the subject photographed was the Winter Palace. "The plates were packed in envelopes inpenetrable to light, and then tied to the feet of the pigeon, who safely and quickly carried them to the station at Volkovo." So we are told; but there is an extensive hiatus in the account, as pointed out by the *British Journal of Photography*. The wonderful material on which the negatives were taken is not stated, nor the mode of preserving from light, nor how this is proposed to be arranged in a balloon, nor the distance of the bird's flight. This is all a very different affair from the Paris Pigeon Post, the messages in which were photographed by collodion on glass, which was afterwards peeled from its support, and enclosed in a packet attached to, not the bird's feet, but a tail-feather. Seeing that about fifteen grains is looked upon as a practical weight for a bird to carry, it would appear that very little negative and light-tight wrapping could be included in the weight, which does not include much in the shape, for example, of thin paper, seeing that even so slight an object as a five-pound (or any other) bank-note weighs more than that amount.

— As showing a good reason for the flocking of students from America and England to Germany, the following letter of Professor Silvanus P. Thompson to the London *Times* is in point: "Your Brussels correspondent, who attributes the attendance of English students at the technical high schools (or *polytechnicums*) in Germany, and particularly at that in Berlin, to the non-existence of such institutions in this country, must be ignorant of the fact that for five years a really splendid establishment of this character has been actively at work in London. I refer to the Central Institution, founded by the City and Guilds of London, in Exhibition Road. The equipment of this establishment for mechanical engineering and for electrical engineering far exceeds that of the Technical High School in Berlin, though in some other departments it is necessarily not equal. The cost of the Central Institution, which is the nearest approach in this country to a true polytechnic, was, however, only £90,000, while that at Berlin cost over £600,000. I may add that that other establishment of the City and Guilds of London Institute, the Finsbury Technical College, from which I write, and which has been open somewhat longer, cost about £35,000 only; but yet it can, in the departments mentioned, show educational results that will not compare unfavorably with those of the Berlin Technical High School. Yet the entire building at Finsbury could be contained within the entrance-hall of the palatial establishment at Berlin." In this same connection the remarks of the German correspondent of the *Daily Telegraph* are nteresting, as they give the number of foreign students enrolled on the books of the *Technische Hochschule*, or "Technical University," of Berlin. Since 1884 the palatial *Technische Hochschule* of Charlottenburg, near Berlin (called the *Berliner Technische Hochschule*), has certainly given instruction to an increasing number of foreign students, but the influx has not been so very extraordinary. Since the winter term of 1885, when there were only two British subjects on the books, the numbers have been, winter of 1886, four; summer of 1887, five; winter of 1887, eight; summer of 1888, ten; winter of 1888, eleven; summer of 1889, thirteen. Russia heads the list, having contributed, in 1881, thirteen pupils, and in the last term, forty-two. Norway comes next, with twenty-five last term. From North America there were seven. Then came Austria, South America, Servia, Switzerland, Sweden, Italy, Roumania, Spain, Holland, Luxembourg, and Greece. The number of foreign students amounted in the last term to 129, some 15 per cent of the total number on the books. This, compared with the thirty-three enrolled in 1881, shows a good increase. From the above official figures no deductions of importance can be drawn as to the estimation shown by British technical students for the very excellent *Technische Hochschule* of Berlin.

— It would seem as if the influence of bacteria and micro-organisms generally upon higher forms of life was only just beginning to be understood. The researches of naturalists are constantly bringing new and unexpected facts to light. For instance: there is nothing better known than the frequent phosphorescence exhibited by marine animals, and especially the crustacea. This phosphorescence is frequently infectious; that is to say, it can be communicated by touch. A French naturalist, M. Giard, has just made known the results of some observations and experiments he has been making with *Talitrus* and other crustacea. On microscopically examining a brightly phosphorescent specimen he found walking slowly on the beach instead of leaping, as its habit usually is, he traced the phosphorescent light to the presence of bacteria in its muscles, which were greatly altered. On inoculating other and healthy individuals of this and other species, the same disease was produced among them, and M. Giard says that his laboratory was quite lit up at night with these diseased but luminous crustacea. The inoculation was continued to the sixth generation, apparently without any attenuation of the microbic action. The disease seems to follow a regular course, and the crustaceans died in three or four days. The phosphorescence, however, always lingered a few hours after death. Crabs were inoculated in the same way.

— Dr. Noetling, of the Indian Geological Survey, to whose report on the petroleum deposits of Burmah reference has already been made, gives an interesting description of the native method of digging oil-wells. As soon as a native has made up his mind where he is going to have a new oil-well, as stated in the *London Times*, the workmen (usually four in number) begin to dig a square shaft, the sides of which measure between four feet and four feet six inches. Over this pit a cross-beam, supported on stanchions at either side, is placed, in the centre of which is a small wooden drum or cylinder, which, with its axis, is made of a single piece of wood, the latter running on coarse fork-shaped supports. The leather rope used in hauling up the oil passes over the drum, and on it is fastened the workman who is going to be lowered down, as well as the common earthenware pot in which the oil is drawn up. If possible, the well is so placed that the men or women drawing the rope walk down an inclined plane along the slope of a hill. The tools employed in digging are quite primitive, and can only be used in soft strata. Timber is used to support the walls of the shaft, and the latter is lined with wood. This wooden wall has considerable strength; but it has to be carefully watched, lest it should give way. The workmen are lowered in an ingenious way. The man sits on two slings formed of strong rope running between his legs and knotted over his left shoulder. To prevent sliding, a thin rope runs down from the knot, across the breast, underneath the right shoulder, to the back, where it is fastened to the rope forming the slings. A second rope for the same purpose is fastened round the hips. On account of the explosive gas filling the shaft, no light can be taken down: the workman, therefore, ties up his eyes previous to descending, so as to enable him to see during the short time he is in the well; otherwise it would take him longer to accustom his eyes to the darkness than he is able to stay down on account of the gas, which renders breathing difficult. The data obtained by Dr. Noetling as to the time occupied in the ascent and descent, and the period during which the laborer can remain below, show that not 25 per cent of the total working time is really spent in extracting the oil. Two hundred and ninety seconds is the longest time any man, however strong, can remain below without becoming unconscious, while in some he can only remain sixty seconds. With increasing depths the difficulties in obtaining the oil after the Burmese methods become insuperable:

hence the limit is 310 feet, and the workers object to more than 250 feet. The drawing-up of the oil is as primitive as every thing else. The rope is fastened round the neck of the ball-shaped pot, and, being lowered, is allowed to fill by sinking in the oil below. The oil thus raised is poured into another pot of the same shape, but much larger; and twelve of these are packed on each country cart.

— Among some mineral samples lately forwarded by Dr. Belgrade to the Mines Department for examination from a newly discovered lode in the Broken Hill district, New South Wales, were three in which the analyst, Mr. Minage, detected the presence of platinum. According to the *Engineering and Mining Journal*, sample No. 1, ochreous felspathic rock, yielded, on assay, platinum at the rate of 1 ounce 9 pennyweights 9 grains per ton; gold, a minute trace; no silver. No. 2, compact ferruginous claystone, yielded, platinum, 6 pennyweights 12 grains per ton; gold, a minute trace; no silver. No. 3, ferruginous felspathic rock with green carbonate of copper, yielded, platinum, a strong trace (under 5 pennyweights per ton); no gold or silver; a small quantity of platinum metals, iridosonine, iridium, etc. This discovery is of interest, as it is the first recorded instance of the occurrence in New South Wales of platinum *in situ* in a lode. Platinum has been found in alluvial deposits in the Bathurst, Clarence, and Richmond River districts, but not in paying quantity.

— Mr. Joseph C. Arthur, in a recent bulletin issued by the Agricultural Experiment Station of Indiana, summarizes as follows the results of some experiments on stinking smut (known as "bunt" in England): It is one of the most destructive diseases to which the wheat-crop is subject; not that it deteriorates the total product, but it causes a complete loss of a part, not infrequently of half or more, of the crop. It probably occurs to some extent throughout all wheat-growing regions, but most prominently in Indiana, Iowa, and adjacent States, as well as in California and Europe. It is caused by a fungus growing inside the wheat-plant. There are two species of this fungus, differing only in microscopic characters, — *Tilletia tritici*, with rough spores; and *Tilletia fœtens*, with smooth spores. The latter is most common in the Mississippi valley. Spores of the fungus, which are very nearly or quite in contact with the germ end of the wheat-grain, or touching the young plantlet between its attachment to the seed and the first joint, can grow into the tender tissues of the plant as the seed sprouts, and, drawing nourishment from the juices, develop along with the wheat, and finally produce spores in the kernels. A single spore may thus cause all the heads of a stool of wheat to smut. The disease does not spread from plant to plant or from field to field, but the infection always takes place at the time the seed sprouts. No remedy can be applied after the grain is sown, but the disease can be prevented by sowing clean seed in a clean soil, and covering well. If a farm is already infested, seed known to be pure can be obtained, or the smutty seed can be purified by thoroughly wetting with a solution of blue vitriol, using one pound or more to a gallon of water, and either sow damp or first dry with plaster or slacked lime. Take care that the thresher, storage bin, fanning mill, seeder, sacks, and every thing else coming in contact with grain to be used as seed, are thoroughly disinfected, if they have previously been used for smutty wheat. Do not follow smutted wheat with wheat again for one, or, better still, for two years, but with some other crop. Do not apply stable-manure or permit stock to run on land to be put into wheat, if smutty grain or straw has been used for feeding or bedding. Where there is danger of infection, do not sow wheat on wet or insufficiently drained land, and use a variety of wheat least affected by smut. The cost and trouble of ridding a farm of stinking smut, and keeping it free, are very slight compared to the loss which is likely to result from inattention. The statements just made regarding stinking smut apply equally well to black smut, with the following exceptions: black smut is more common everywhere than the other, and causes a loss greater than is usually supposed, but which rarely reaches the large percentages of stinking smut; it is caused by a fungus (*Ustilago segetum*) of similar habits to the other smut, but, unlike that, is not confined to wheat, but attacks other small grains as well; the means of clearing a farm of black smut are essentially the same as for the other, but with the differences that wheat, oats, rye, and barley are all susceptible to the disease, and cannot follow one another when clearing the soil of the spores; and that grain with hulls requires longer soaking with blue vitriol than hulless grain.

— In a recent letter to the company engaged in introducing the magnolia anti-friction metal, mentioned in these columns a few weeks ago, the chief engineer of the steamship "Owego" gives a very favorable report of its use on that vessel. The "Owego" is said to be the fastest vessel on the Great Lakes. She is 2,500 tons burden, and has triple-expansion engines of 3,000 horse-power, with cylinders 28, 42½, and 72 inches in diameter respectively, and 4½ feet stroke. Some time ago the metal used in the low-pressure crank-pin bearing, fourteen inches in diameter by sixteen inches long, heated till it melted and ran out. Magnolia-metal was substituted, since which time, the engineer states, "the chill has not been off the brasses, although we have encountered weather that would lift the propeller-wheel out of the water."

— The lecture committee of the Nineteenth Century Club reports that its programme this season has been arranged so as to give a greater preponderance to literature and art, in order to meet the criticism of last winter that the subjects were too much of a political and ethical character. It was not, however, originally intended that Miss Edwards's address should be on the "Art of the Novelist;" but this topic seemed preferable because her other addresses will be delivered in New York and Brooklyn before she will appear before the club. The following is the list of subjects and speakers as thus far arranged; subject, of course, to unforeseen changes. A star against a name indicates that the speaker is not yet positively engaged. Nov. 22, 1889, "The Pulpit and Politics," Rev. Henry Van Dyke, D.D. (Presbyterian): discussion by Mr. R. R. Bowker (Episcopalian), Rev. Amory H. Bradford, D.D. (Congregationalist), and Hon. Jno. A. Taylor (Unitarian). Dec. 13, "The Construction of a Play," Mr. Bronson Howard: discussion by A. M. Palmer, Mr. Dion Boucicault.* Jan. 10, 1890, "Russian Nihilists and Novelists," Professor H. H. Boyesen: discussion by Mr. Hamilton W. Mabie (associate editor of the *Christian Union*), and ————. Jan. 31, "The Political Relations of the United States and Canada," Professor Goldwin Smith (of Toronto): discussion not yet settled. Feb. 21, "The New Southern Literature," Mr. Thomas Nelson Page (of Virginia): discussion by Mr. Richard Watson Gilder and Mrs. Maud Howe Elliott. March 18, "The Art of the Novelist," Miss Amelia B. Edwards: discussion not yet settled. April 4, an address by Hon. Seth Low on some topic, probably educational, not yet determined upon. April 25, "The Eastern Question," Hon. Oscar S. Straus (ex-minister to Turkey): discussion by Mr. George Kennan. The following are proposed and held in reserve: "Folk Music," by Mr. Frank H. Potter; "Nationalism," by Hon. T. W. Higginson;* "Psychical Research," by Rev. Minot J. Savage, D.D.;* "The Roman Church and the Schools," by Hon. W. Bourke Cockram;* "English Socialism," Mr. Percival Chubb;* "The Organization of Charity;" "Dress Reform." Friday evenings have been taken this year instead of Wednesdays because last year many members of the club were unable to attend on the last-named day. On other days the assembly rooms are not to be had. Accordingly the house committee has engaged the rooms for the above dates; Miss Edwards's lecture, however, being on Tuesday, by the special favor of the manager of the Opera House. The following orders have been made with regard to the conversational meetings provided for by vote at the last business meeting of the club: 1st, That the four members' meetings to be held the coming winter at private houses be conducted informally and conversationally, as far as due regard to order will permit. 2d, That the president designate some member of the club to preside over and conduct each of these meetings. 3d, That the person so designated shall, at least ten days prior to the meeting over which he is to preside, select and give to the secretary the subject to be discussed, which must first be approved by the lecture committee of the club. The secretary shall thereupon give at least one week's notice to all the members, of the time and place of such meeting, together with the subject to be discussed. 4th, No vote shall be taken upon any subject of discussion at any of these meetings.